

LITVINENKO, L.M.; RUDAKOV, Ye.S.; KIRICHENKO, A.I.

Kinetics of the reaction of m-chloroaniline with benzoyl chloride  
in mixtures of benzene with pyridine. Kin.i kat. no.5:651-660  
S-O '62. (MIRA 16:1)

1. Khar'kovskiy gosudarstvennyy universitet i Novosibirskiy institut  
organicheskoy khimii Sibirskogo otdeleniya AN SSSR.  
(Aniline) (Benzoylation) (Pyridine)

LITVINENKO, L.M.; ALEKSANDROVA, D.M.; TITSKIY, G.D.

Carboxylic acids as a medium for the preparative acylation  
of aromatic amines. Ukr. khim. zhur. 28 no.1:77-80 '62.

(MIRA 16:8)

1. Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo.

LITVINENKO, L.M.; POPOV, A.F.

Kinetics of the reaction of diethylamine with aryl sulfochlorides  
in a benzene solution. Zhur.ob.khim. 33 no.4:1059-1069 Ap '63.  
(MIRA 16:5)

(Sulfonyl chlorides)

(Diethylamine)

LITVINENKO, L.M.

Structure and reactivity of aromatic amines. Izv. AN SSSR, Otd. khim.  
nauk no.10:1737-1748 0'62. (MIRA 15:10)

1. Khar'kovskiy universitet im. A.M.Gor'kogo.  
(Amines) (Acylation)

LITVINENKO, L.M.; OLEYNIK, N.M.

Kinetics of the reactions of benzoyl chloride with primary aromatic amines in nitrobenzene. Zhur.ob.khim. 32 no.7:2290-2298  
Jl '62. (MIRA 15:7)

1. Khar'kovskiy gosudarstvennyy universitet imeni A.M.Gor'kogo.  
(Benzoyl chloride) (Amines)

LITVINENKO, L.M.; OLEYNIK, N.M.

Bifunctional catalysis by carboxylic acids during the acylation of aromatic amines with organic acid chlorides in a nitrobenzene solution. Zhur.ob.khim. 33 no.7:2287-2298 J1 '63. (MIRA 16:8)

1. Khar'kovskiy gosudarstvennyy universitet.  
(Amines) (Acids, Organic) (Catalysis)

LITVINENKO, L.M.

Polyfunctional catalysis in organic chemistry. Ukr. khim.  
zhur. 30 no.4:317-330 '64. (MIRA 17:6)

1. Nauchno-issledovatel'skaya laboratoriya kinetiki i kataliza  
organicheskikh reaktsiy pri Khar'kovskom universitete.

LITVINENKO, L.M.; OLEYNIK, N.M.

Remarks on the article of Loucheux Banderet "Interaction of  
arylamines with acid anhydrides. Study of kinetics". Ukr.khim.  
zhur. 30 no.11:1200 '64. (MIRA 18:2)

1. Klar'kovskiy gosudarstvennyy universitet, Nauchno-issledovatel'-  
skaya laboratoriya kinetiki i kataliza organicheskikh reaktsiy.



LITVINENKO, L.M.; DADALI, V.A.; SAVELOVA, V.A.; KRICHEVTSOVA, T.I.

New method of synthesizing arylsulfonyl bromides and iodides.  
Zhur. ob. khim. 34 no.11:3730-3733 N '64 (MIRA 18:1)

1. Khar'kovskiy gosudarstvennyy universitet imeni A.M. Gor'kogo.

L 16445-65 EMT(n)/EPF(e)/EWP(j) Pc-4/Pr-4 RPL JW/RM

ACCESSION NR: AP4043839

S/0020/64/157/003/1153/1155

AUTHOR: Litvinenko, L. M.; Oleynik, N. M.; Titskiy, G. D.

TITLE: The direction of the search for new bifunctional catalysts

SOURCE: AN SSSR. Doklady\*, v. 157, no. 5, 1964, 1153-1155

TOPIC TAGS: bifunctional catalyst model, nucleophilic group, electrophilic group, nitrogen, sulfur, thioacetic acid, carboxylic acid diacamide, carboxylic acid arylamide, dibenzoylamide, reaction rate constant, monomer, hydrogen bond

ABSTRACT: The model for such a search could be a very simple enzymatic process; the catalyst should carry a nucleophilic and an electrophilic group. Compounds of formula I



where M is any atom other than oxygen, were studied, using as M the elements nitrogen and sulfur which adjoin oxygen in the periodic chart in the form of thio-

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L 16445-65

ACCESSION NR: AP4043839

3

acetic acid and diacylamides or arylamides of carboxylic acids. The catalytic properties of the compounds under study were determined by the acylation reaction of aromatic amines with benzoyl chloride in benzene. The velocity constants were calculated according to formula 2;  $k = k_a + k_{Am}$ ;  $k$  showed a linear dependency upon the analytic concentration  $m$  of thioacetic acid, diacetylamine and dibenzoylamine; this would indicate a monomeric state of the substance. Infrared spectra confirmed this in thioacetic acid. The catalytic velocity constants (according to (2)) are tabulated; the carboxylic acid amides had no catalytic properties, due probably to the weak acidity of the amidic hydrogen. Thioacetic acid had only 1/30 the catalytic activity of acetic acid. This unexpected result is explained by pointing to the low hydrogen-bonding ability of thiocarboxylic acids. Bi-functional catalysts must be able to form hydrogen bonds. The catalytic properties of formula I probably depend upon its ability to form hydrogen bonds rather than its acidity. Such considerations might open new paths for finding efficient bifunctional catalysts in reactions of nucleophilic substitution at the carbonyl atom. Orig. art. has: 4 formulas, 1 table and 1 figures.

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I. 16445-65

ACCESSION NR: AP4043839

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kego  
(Khar'kov State University)

SUBMITTED: 04Apr64

ENCL: 00

SUB CODE: GC

NO REF SOV: 010

OTHER: 005

Card 3/3

LITVINENKO, I.M.; POPOV, A.F.; TOKAREV, V.I.

Kinetics of reactions complicated by the effect of autocatalysis.  
Kin. i kat. 6 no.3:510-521 My. Iz '65.

(MIRA 18:20)

L. Khar'kovskiy gosudarstvennyy universitet.

LITVINENKO, L.M.; KIRICHENKO, A.I.

Catalytic effect of pyridine on the reaction of benzoyl chloride  
with primary aromatic amines. Ukr. khim. zhur. 31 no.1:67-75 '65.  
(MIRA 18:5)

1. Khar'kovskiy gosudarstvennyy universitet imeni Gor'kogo.

LUTSKIY, A.Ye.; LITVINENKO, L.M.; SHUBINA, L.V.; MALKES, L.Ya.; CHESHEKO, R.S.;  
GOL'BERKOVA, A.S.; KANEVSKAYA, Z.M.

Interaction of substituents through aromatic rings linked  
by a bridge group. Zhur.ob.khim. 35 no.12:2083-2090 D '65.  
(MIRA 19:1)

1. Khar'kovskiy politekhnicheskii institut im. V.I.Lenina.  
Submitted May 28, 1964.

LITVINENKO, L.M.; POPOV, A.F.

Nature of interaction between aryl sulfochlorides and primary  
alkylamines in a benzene solution. Dokl. AN SSSR 160 no.5:1124-  
1127 F '65. (MIFA 18:2)

1. Khar'kovskiy gosudarstvennyy universitet. Submitted August  
19, 1964.



L 22873-65 EEC(b)-2/EWT(1)/EEC(t)  
ACCESSION NR: AP5002320

S/0141/64/IXV/005/0887/089725

AUTHOR: Litvinenko, L. N.

TITLE: Diffraction of a plane H-polarized electromagnetic wave by a grating of special geometrical form

SOURCE: IVUZ. Radiofizika, v. 7, no. 5, 1964, 887-897

TOPIC TAGS: electromagnetic wave diffraction, polarized wave, diffraction grating, diffraction array

ABSTRACT: The periodic grating investigated is made up of infinitesimally thin ideally conducting metallic ribbons located so that one narrow ribbon is located exactly at the midpoint between two broad ribbons. The wave is assumed to be normally incident. It is pointed out that although the diffraction of an H-polarized electromagnetic wave can be calculated from the solution of an E-polarized wave and the duality principle, a direct calculation of the H-polarized wave is of interest in itself. Equations are derived for the reflection coefficients and for the amplitudes of the diffraction spectra, for which numerical

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L 22873-65

ACCESSION NR: AP5002320

calculations are presented as a function of the length of the incident wave for different dimensions of the grating element. The results can be used to solve the problem of a complementary grating with unequal slots, which normally cannot be reduced to the initial form by variation of the parameters. "The author thanks V. A. Marchenko, V. P. Shestopalov, and K. V. Maslov for interest in the work." Orig. art. has: 8 figures and 27 formulas.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet (Khar'kov State University)

SUBMITTED: 26Sep63

ENCL: 00

SUB CODE: EC, EM

NR REF SOV: 004

OTHER: 000

Card 2/2

L 38117-65 EWT(1)/EWT(m)/REC(t)/T/EWP(t)/EWP(b)/EWA(c) Pg-4/Pi-4 JD/  
 ACCESSION NR: AP5006040 LEB/GG 8/0141/64/07/006/1211/1214

AUTHOR: Litvinenko, L. N.

TITLE: Diffraction of electromagnetic wave by a plane metallic grating of special shape with dielectric and screen (case of normal incidence)

SOURCE: IVUZ. Radiofizika, v. 7, no. 6, 1964, 1211-1214

TOPIC TAGS: electromagnetic wave diffraction, diffraction grating, diffraction array, dielectric antenna, slot antenna 25B

ABSTRACT: The article deals with the diffraction of a normally-incident electromagnetic wave on a grating of special form adjacent to a dielectric layer, and on a screened grating in which the space between the grating and the screen is filled with dielectric (the electric vector is parallel to the ribbons of the grating). The grating is made up of ribbons of alternating width, with two ribbons in each period of the grating, so arranged that the slots between the ribbons are equal. The dielectric constant is assumed to be isotropic and complex. Formulas are derived for the reflection and transmission coefficients.

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L 38117-65

ACCESSION NR: AP5006040

on the metallic parts and on the gaps. The resonance effects due to the loss in the dielectric are discussed. It is shown in the conclusion that the results are applicable also to optically active media with negative dielectric constant. "The author thanks V. P. Shestopalov for valuable hints." Orig. int. has: 3 figures and 6 formulas.

ASSOCIATION: Khar'kovskiy institut gornogo mashinostroyeniya, avtomatiki i  
teletekhniki (Khar'kov Institute of Mining, Machine Building, Auto-  
mation, and Computation Techniques)

~~Section, and Computation Techniques~~

SUBMITTED: 09Apr64

INCL: 00

SUB COI: EC, EM

NR REF BOV: 004

OTHER: 000

*ml*  
Card 2/2

L 18846-65 EWT(d)/EWT(1)/EEG(k)-2/EEG-4/EEG(t)/EEG(b)-2 Pn-4/Pg-4/Pt-10/P1-4  
AFWL/SSD(c)/RAEM(a)/SSD/ASD(a)-5/RAEM(c)/RAEM(j)/ESD(gs)/ESD(t) WS

ACCESSION NR: AP4043035

S/0057/64/034/011/1962/1970

AUTHOR: Gestrin, G.N.; Litvinenko, L.N.; Maslov, K.V.; Shestopalov, V.P.

TITLE: Diffraction and propagation of electromagnetic waves in plane and cylindrical periodic structures of special geometric form. 1.

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.11, 1964, 1962-1970

TOPIC TAGS: electromagnetic wave diffraction, diffraction grating, polarization filter

ABSTRACT: The authors calculate the diffraction of plane electromagnetic waves by a plane periodic structure consisting of perfectly conducting bands of alternate widths separated by equal gaps, as shown in Fig.1 of the Enclosure. This problem has been previously solved for normal incidence (G.N.Gestrin, K.V.Maslov, V.P.Shestopalov, Uch.zap.Khar'kovsk.gos.univ. i Khar'kovsk.matem.obshch.30,1963; L.N.Litvinenko, Izv.VUZov,Radiofizika,7,6,1964) by methods described by Z.S.Agrinovich, V.A.Marchenko and V.P.Shestopalov (ZhTF 32,No.4,1962). In the present paper this calculation is generalized, with the aid of more recent methods of A.I.Adnina and V.P.Shestopalov (ZhTF 33,No.6,1963), to the case of oblique incidence with the propaga-

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L 18846-65

ACCESSION NR: AP4049035

tion vector perpendicular to the x-axis (see Fig.1). The results of the cited papers are quoted at critical stages of the calculation, which, accordingly, cannot readily be followed without reference to them. The calculation of the transmission coefficient is reduced in the end to the solution of an infinite set of linear equations. These were approximated by eleven of them, and the approximate set was solved numerically with the aid of a computer. The results are presented graphically, separately for E-polarization (electric vector parallel to the x-axis) and H-polarization. The inclusion of narrow conducting bands between the wider ones was found to influence the diffraction of E-polarized waves much more than that of H-polarized waves. Gratings of the type discussed, therefore, may find application as polarization filters. It is also possible to achieve considerable saving of metal in the construction of a diffraction grating with specified transmission for E-polarized waves by employing alternate bands of different width. Orig.art.has: 37 formulas and 7 figures.

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L 18846-65

ACCESSION NR: AP4049035

2

ASSOCIATION: Khar'kovskiy institut gornogo mashinostroyeniya, avtomatiki, i vy\*chislitel'noy tekhniki (Khar'kov Institute of Mining Machinery Construction, Automation and Computer Engineering); Khar'kovskiy gosudarstvennyy universitet im.A.M. Gor'kogo (Khar'kov State University); FTI nizkikh temperatur AN UkrSSR (Low Temperature Physicotechnical Institute, AN UkrSSR)

SUBMITTED: 06Feb64

ENCL: 01

SUB CODE: EM, OP

NR REF SOV: 004

OTHER: 000

3/4



L 18846-65

ACCESSION NR: AP4049035

ENCLOSURE: 01

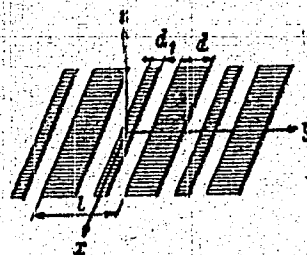


Figure 1. Diffraction grating.

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L 18845-65 EWT(d)/EWT(1)/EEC(k)-2/EEC-4/EEC(t)/SEC(b)-2 Pn-4/Pg-4/Pt-10/  
P1-4 SSD/RAEM(a)/ASD(a)-5/AFETR/AFWL/ESD(c)/ESD(gs)/ESD(t) WS

ACCESSION NR: AP4049036

S/0057/64/004/011/1971/1978

AUTHOR: Gestrin, G.N.; Litvinenko, L.N.; Maslov, K.V.; Shestopalov, V.P.

TITLE: Diffraction and propagation of electromagnetic waves in plane and cylindri-  
cal periodic structures of special geometric form. 2. B

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.11, 1964, 1971-1978

TOPIC TAGS: waveguide, waveguide slot, waveguide diffraction, waveguide loss, wave propagation

ABSTRACT: The authors employ the method of equivalent boundary conditions discussed by V.A. Marchenko (Matemat. sbornik 63,4,105,1964) to derive dispersion equations for annular waveguides and helical waveguides of special form, as illustrated in Fig.1 of the Enclosure. These dispersion equations are valid only when the free-space wavelength is small compared with the radius of the waveguide. The appropriate equivalent boundary conditions are derived with the aid of the solution to the related plane diffraction problem treated by the authors in paper 1 of the present series (ZhTF 34,1962,1964; see Abstract AP4049035). The dispersion equation for the annular waveguide (but not that for the helical waveguide) was solved numerically

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L 18845-65

ACCESSION NR: AP4049036

for  $E_{01}$  and  $H_{01}$  modes by Newton's method, and the results are presented graphically and compared with analogous results for the simple ring waveguide obtained by A.S.Agranovich and V.P.Sheatopalov (ZhTF 34.1950,1964;see Abstract AP4049034). The behavior of the special annular waveguide is in general similar to that of the simple ring waveguide. The presence of a narrow ring within the gap, however, greatly reduces the attenuation of the  $H_{01}$  wave, while affecting that of the  $E_{01}$  wave only slightly, and it reduces the width of the high attenuation band and shifts its position toward the higher frequencies. This last effect may find technical application. Orig.art.has: 12 formulas and 7 figures.

ASSOCIATION: Khar'kovskiy institut gornogo mashinostroyeniya, avtomatiki i vy\*chislitel'noy tekhniki (Khar'kov Institute of Mining Machinery Construction, Automation and Computer Engineering); FT nizkikh temperatur AN UkrSSR (Low Temperature Physicotechnical Institute, AN UkrSSR); Khar'kovskiy gosudarstvennyy universitet im. A.M.Gor'kogo (Khar'kov State University)

SUBMITTED: 06Feb64

ENCL: 01

SUB CODE: EM

NR REF SOV: 007

OTHER: 000

2/3

L 18845-65

ACCESSION NR: AP4049036

ENCLOSURE 01

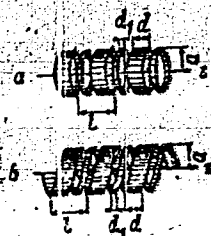


Figure 1. Waveguides of special geometric form. a - Ring waveguide, b - helical waveguide.

Card 3/3

LITVINENKO, L.N.; SHESTOPALOV, V.P.

Diffraction characteristics of two-element nonsymmetrical metal grids. Radiotekh. i elektron. 10 no.6:1131-1134 Je '65.

(MTRA 18:6)

1. Khar'kovskiy institut gornogo mashinostroyeniya, avtomatiki i vyshislitel'noy tekhniki.

ACC NR: AT6034340

SOURCE CODE: UR/0000/66/000/000/0113/0130

AUTHORS: Litvinenko, L. N. (Khar'kov); Shestopalov, V. P. (Khar'kov)

ORG: none

TITLE: Diffraction of electromagnetic waves on plane metallic two-element lattices

SOURCE: Chislennyye metody resheniya zadach matematicheskoy fiziki (Numerical methods of solving problems in mathematical physics); sbornik statey. Moscow, Izd-vo Nauka, 1966, 113-130

TOPIC TAGS: electromagnetic wave diffraction, metal surface, electric polarization

ABSTRACT: The diffraction of electromagnetic waves on metallic two-element lattices is studied analytically. The case of normal incidence is considered first, and the metallic lattices are assumed to be infinitely thin ideal conductors. They are placed so as to allow strips with two different widths within a single period. The distance between the two nearest wide strips is given by  $d$ , and the width of the narrow strip by  $d'$  (see Fig. 1). The electromagnetic field is given by

$$E^{(nag)} = E_0 e^{-ikz}, \quad H^{(nag)} = H_0 e^{-ikz}, \quad (1)$$

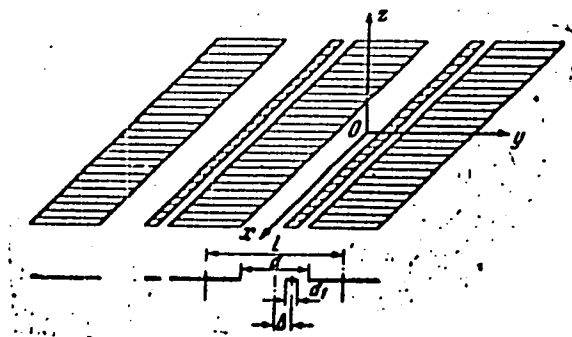
where the intrinsic electric field is constant along the  $Ox$  axis and periodic along the  $Oy$  axis. In the upper and lower half-space, the fields are given by

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UDC: 517.9:535.4

ACC NR: AT6034340

Fig. 1.



$$\begin{aligned} E_x^1 &= e^{-ikz} + \sum_{n=-\infty}^{\infty} a_n e^{i\gamma_n z} e^{i\sin n\pi y/l} \quad (z > 0), \\ E_x^2 &= \sum_{n=-\infty}^{\infty} b_n e^{-i\gamma_n z} e^{i\sin n\pi y/l} \quad (z < 0), \end{aligned} \quad (2)$$

where

$$\gamma_n = \sqrt{k^2 - \left(\frac{2n\pi}{l}\right)^2}, \quad k = \frac{2\pi}{\lambda} \quad (3)$$

To calculate the coefficients  $a_n$  and  $b_n$  a Riemann-Hilbert problem is arrived at, leading to a set of functional relations of the type

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ACC NR: AT6034340

$$\begin{aligned}
 0 &= i\kappa b_0 V_0^n - i\kappa V_0^n + \sum_{n \neq 0} X_n \chi_n V_0^n \frac{|n|}{n} + 2(c_2 R_0 + c_1 R_{-1}), \\
 -b_0 &= i\kappa b_0 V_0^n - i\kappa V_0^n + \sum_{n \neq 0} X_n \chi_n V_0^n \frac{|n|}{n} + 2(c_2 R_0 + c_1 R_0^{(-1)}), \\
 -b_0 &= i\kappa b_0 W_0^n - i\kappa W_0^n + \sum_{n \neq 0} X_n \chi_n W_0^n \frac{|n|}{n} + 2(c_2 \tilde{R}_0 + c_1 \tilde{R}_0^{(-1)}), \\
 X_m &= i\kappa b_0 V_m^n - i\kappa V_m^n + \sum_{n \neq 0} X_n \chi_n V_m^n \frac{|n|}{n} + 2(c_2 R_m + c_1 R_{m-1}) \\
 &\quad (m \neq 0),
 \end{aligned} \tag{4}$$

where

$$\begin{aligned}
 V_n(\zeta_0) &= \frac{1}{\pi i} \int_{L_1} \frac{\zeta^n}{\zeta - \zeta_0} V(\zeta - \alpha)(\zeta - \gamma)(\zeta - \beta)(\zeta - \bar{\alpha}) d\zeta, \quad \zeta_0 \in L_1; \\
 r_m^n &= \frac{1}{2\pi} \int_{\substack{-\theta \leq \varphi \leq -\theta' + \delta \\ \theta' + \delta \leq \varphi \leq \theta}} V_n(e^{i\varphi}) R(e^{i\varphi}) e^{-im\varphi} d\varphi, \\
 R_m &= \frac{1}{2\pi} \int_{\substack{-\theta \leq \varphi \leq -\theta' + \delta \\ \theta' + \delta \leq \varphi \leq \theta}} R(e^{i\varphi}) e^{-im\varphi} d\varphi; \\
 r_0 &= \sum_{m \neq 0} (-1)^m \frac{R_m}{m}, \quad \tilde{R}_0 = \sum_{m \neq 0} \frac{R_m}{m} e^{im\delta},
 \end{aligned} \tag{5}$$

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ACC NR: AT6034340

$$R_0^{(-1)} = \sum_{m \neq 0} (-1)^m \frac{R_{m-1}}{m}, \quad \tilde{R}_0^{(-1)} = \sum_{m \neq 0} \frac{R_{m-1}}{m} e^{im\theta},$$

$$V_0^n = \sum_{m \neq 0} (-1)^m \frac{V_m^n}{m}, \quad W_0^n = \sum_{m \neq 0} \frac{V_m^n}{m} e^{im\theta}.$$

A similar set of functions is obtained for the case of oblique incidence where the electric field equations are

$$E_z^{(1)} = e^{-ik(y \sin \alpha + z \cos \alpha)} + \sum_{n=-\infty}^{\infty} \bar{a}_n \exp(i\bar{\gamma}_n z) \exp(i\bar{h}_n y) \quad (z > 0),$$

$$E_z^{(2)} = \sum_{n=-\infty}^{\infty} \bar{b}_n \exp(-i\bar{\gamma}_n z) \exp(i\bar{h}_n y) \quad (z < 0). \quad (6)$$

$$\bar{h}_n = -k \sin \alpha + \frac{2\pi n}{l}, \quad \bar{\gamma}_n = \sqrt{k^2 - \left(\frac{2\pi}{l}\right)^2 (n - \kappa \sin \alpha)^2}.$$

Each of the functions in equation (5) is evaluated separately where amplitudes of the harmonics with symmetric indices are unequal ( $b_n \neq b_{-n}$ ). It is shown that the solution of the finite set given above ( $N = n > 0$ ) exists and is unique. Orig. art. has: 45 equations and 3 figures.

SUB CODE: 20/ SUBM DATE: 100oct64/ ORIG REF: 008

Card 4/4

ACC NR: AR7000848

SOURCE CODE: UR/0058/66/000/009/D093/D093

AUTHOR: Litvinenko, L. N.

TITLE: The effect of gratings of special geometric shape on the generator of a plane parallel optically active layer

SOURCE: Ref. zh. Fizika, Abs. 9D756

REF SOURCE: Radiotekhnika. Resp. mezhved. nauchno-tekhn. sb., vyp. 1, 1965, 94-100

TOPIC TAGS: paramagnetic laser, optic model

ABSTRACT: The effects of strip-type gratings on the production of a plane-parallel layer with an inversion of the population were investigated. The self-excitation conditions of generation and energy characteristics of radiation of such a layer were computed. The plane-parallel layer with inversion of population is the most simple model of lasers and optical amplifiers. The results of this investigation can be used for a preliminary analysis of the operation of lasers and optical amplifiers.  
V. Khudovoy. [Translation of abstract] [NT]

SUB CODE: 20/

Cord 1/1

LITVINENKO. L. T. Cond Biol Sci -- "Study of the biological and physicochemical properties of modified proteins (myogen -A group)." Kiev, 1960 (Acad Sci UkSSR. Department of Biol Sci ). (KL, 1-61, 188)

-128-

LITVINENKO, L.T. [Lytvynenko, L.T.]

Properties of  $\alpha$ -glycerophosphate dehydrogenase during its interaction with aldolase. Ukr. biokhim. zhur. 32 no.5:636-644 '60.  
(MIRA 14:1)

1. Institut biokhimii Akademii nauk Ukrainskoy SSR, Kiyev.  
(GLYCEROPHOSPHATE DEHYDROGENASE) (ALDOLASE)

LITVINENKO, L.T. [Lytvynenko, L.T.]

Some physicochemical properties of modified myogen A. Ukr. biokhim.  
zhur. 32 no.6:775-782 '60. (MIRA 14:1)

1. Institute of Biochemistry of the Academy of Sciences of the  
Ukrainian S.S.R., Kiev.  
(MYOGEN)

LITVINENKO, L.T. [Lytvynenko, L.T.]; GULYY, M.F. [Hulyi, M.F.]; POLIKARPOVA,  
N.I.

Effect of modifying factors on thiol groups and the biological properties of proteins. Ukr. biokhim. zhur. 35 no.4:483-495 '63.

(MIRA 17:11)

1. Institute of Biochemistry of the Academy of Sciences of the Ukrainian S.S.R., Kiev.

LITVINENKO, L.V. [Lytvynenko, L.V.]; KOVARSKAYA, B.M. [Kovars'ka, B.M.]  
kand. tekhn. nauk; KORNEV, K.A. [Korniev, K.A.], doktor kniz.  
nauk

Thermomechanical properties of epoxy resins based on diglycide  
esters, diglycide ethers and phthalic anhydride. Khim. prom.  
no.4:10-12 C-9 '64. (MIRA 18:9)

KORNEV, K.A. [Korniev, K.A.]; LITVINENKO, L.V. [Lytvynenko, L.V.]

Epoxy monomers based on dimethylol diamides of dicarboxylic acids  
and phenols. Khim. prom. [Ukr.] no.3:36-37 J1-S '64.

(MIRA 17:12)



LITVINENKO, M.

Gases--absorption and adsorption

Rate of absorption of hydrogen sulfide by aqueous sodium or potassium carbonate solution. Zhur. prikl. khim. 25 no. 7, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 195<sup>2</sup>~~8~~, Uncl.

LITVINENKO, M.

KARGIN, V.A.

5(3) p4

PHASE I BOOK EXPLOITATION

SOV/1589

Academiya nauk SSSR.

Khimiya bol'shikh molekul, sbornik statey (Chemistry of large molecules; Collection of articles) Moscow, izd-vo AN SSSR, 1958. 299 p. (series: Akademiya nauk SSSR. Nauchno-populyarnaya seriya) 30,000 copies printed.

Compiler: G.V. Belovskiy; Resp. Ed.: A.V. Topchiyev, Academician; Ed. of Publishing House: V.A. Boyarskiy; Tech. Ed.: I.M. Guseva.

PURPOSE: This book is intended for a wide circle of readers including those who have had no training in chemistry. It can also serve as a manual for propagandists, teachers, and journalists.

# Chemistry of Large Molecules (Cont.)

SOV/1589

COVERAGE: This collection of articles reflects the trend for the future development of the Soviet chemical industry as indicated by the 1957 plenary session of the Central Committee of the Communist Party within the framework of the new Seven Year Plan. These articles, published in newspapers and journals, developed the theme of accelerated development of the chemical industry, and sciences, with stress on the manufacture of synthetic fibers, plastics, and other materials. Some of the articles were abridged, revised, or enlarged. The articles were selected so as to give an adequate survey of the chemistry and technology of high-molecular-weight compounds and their use in industry, agriculture, and in the manufacture of consumer goods. Mentioned are raw materials for the production of polymers. This book belongs to the popular-science series of the Academy of Sciences. Similar volumes are intended for future publication. No references are given.

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Card 7/8

LITVINENKO, M., inzh.

Alunite-anhydride cement. Stroi.mat. 4 no.10:32 0 '58.  
(Alunite) (Cement) (MIRA 11:11)

IVANOV-DYATLOV, I.G., prof.; AGEYEV, D.N., inzh.; LITVINENKO, M.A.,  
inzh.

Constructing and using a highway bridge built of reinforced  
keramzit-concrete. Avt.dor. 23 no.2:8-10 P '60.  
(MIRA 13:5)

(Bridges, Concrete)

SLOBODYANIK, Ignat Yakovlevich [Slobodiansky, I.IA.], kand.tekhn.nauk;  
PASHKOV, Igor' Aleksandrovich [Pashkov, I.O.], kand.tekhn.nauk;  
CHUPRUNENKO, Yekaterina Vasil'yevna [Chuprunenko, IE.V.], kand.  
tekhn.nauk; CHERKASOV, Nikolay Antonovich [Cherkasov, M.A.], kand.  
tekhn.nauk; LYSINA, Nina Borisovna, inzh.; RUBINOVICH, Esfir'  
Abramovna, inzh.; PAL'CHIK, Petr Karpovich, inzh.; LITVINENKO,  
Melan'ya Dmitriyevna, inzh.; SVARICHEVSKIY, Lyubomir Vladimirovich  
[Svorychevs'kyi, L.V.], inzh.; OSOVSKAYA, I. [Osovs'ka, I.], red.;  
ZELENKOVA, Ye. [Zelenkova, IE.], tekhn.red.

[Local binding materials based on new raw materials of the Ukraine]  
Mistsevi v'iazhuchi na novii syrovyni Ukrainy. Za zahal'noiu red.  
I.IA.Slobodiansky. Kyiv, Derzh.vyd-vo lit-ry z budivnytstva i  
arkhit.URS, 1960. 115 p. (MIRA 13:10)  
(Ukraine--Binding materials)

LITVINENKO, M.D.

Effect of potentiation on the depth of ether anesthesia in  
experimental visceral surgery. Vest. khir. 84 no. 4:100-106  
Ap '60. (MIRA 14:1)  
(HIBERNATION) (ANESTHESIA) (SURGERY, OPERATIVE)

LITVINENKO, M.D.

Some problems of intubation technic in endotracheal anesthesia.

Khirurgiia 34 no.6:125-126 Je '58

(MIRA 11:8)

1. Iz propedevticheskoy khirurgicheskoy kliniki (zav. - prof. I.V. Shmelev) Kubanskogo meditsinskogo instituta (dir. - prof. V.K. Suprunov)  
(ANESTHESIA, ENDOTRACHEAL,  
intubation technic, problems (Rus))

LITVINENKO, M. G.

"Improving the Hygienic Quality of Drinking Water by Treating It With Coagulating Agents and Activators." Cand Med Sci, Khar'kov Medical Inst, Khar'kov, 1953. (RZhKhim, No 22, Nov 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (11)

SO: Sum. No. 521, 2 Jun 55



URAZAKOV, I.U.; KIM, L.N.; LITVINENKO, M.I.; TEN, O.D.

Treatment of residual manifestations of poliomyelitis in children  
with Sary-Bulak mud. Zdrav. Kazakh. 18 no.1:36-41 '48. (MIRA 13:7)

1. Iz Instituta klinicheskoy i eksperimental'noy khirurgii AN  
KazSSR i detbol'nitsa "Askay" Alma-Atinskogo gorzdrava.  
(POLIOMYELITIS)

(SARY-BULAK (KAZAKHSTAN)---BATHS, MOOR AND MUD)

5(1)

SOV/19-59-6-35/309

AUTHOR: Gol'dfarb, M.I., Litvinenko, M.I., Kolesnikov, A.S.,  
Agal'tsov, M.M., Voronov, A.S., and Klykova, Z.P.

TITLE: A Method of Obtaining Aniline

PERIODICAL: Byulleten' izobreteniy, 1959, Nr 6, p 11 (USSR)

ABSTRACT: Class 12q, 3. Nr 118506 (364263 of 29 July 1948).  
Submitted to the USSR Gostekhnika. Obtaining  
aniline by the reduction of nitro-benzene with  
cast-iron shavings and an electrolyte. To obtain  
a continuous process, a total reduction of nitro-  
benzene, and a concurrent withdrawal of aniline with  
water vapors, the reaction components are first hea-  
ted up to a temperature near that of the reaction,  
and then passed through the reaction apparatus. The  
apparatus is provided with a system drawing off ani-  
line from the vapors formed during the reduction pro-

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SOV/19-59-6-35/309

A Method of Obtaining Aniline

cess, and with a system for distilling aniline out of the mass being continuously withdrawn from the apparatus.

Card 2/2

LITVINENKO, M. I.

BAK

130P

ICF FIRM NO.	ICF CARD NO.	TREASURE ISLAND	SERIAL NO.	134862	
PROPER NAME		NAME OTHER THAN PROPER	MINISTRY & NO.		
PLACE	ADM. SUBDIVISION	COUNTRY	AF CHART NO.		
Moskva	Moskovskaya o., RSFSR	USSR	167		
SUBJECT			CATEGORY	SHEETS	
State Planning Institute for Aniline Dye Industry			40	1	
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M. I. Litvinenko is chief engineer of the Giproanilinkraska (Gosudarstvennyy Institut Proyektirovaniya Anilokrasochnoy Promyshlennosti--State Planning Institute for the Aniline Dye Industry)\*.

S/063/61/006/001/004/005  
A051/A129

AUTHOR: Litvinenko, M. I.

TITLE: Modernizing the apparatus and intensifying the technological processes in phthalic anhydride production

PERIODICAL: Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva im. D. I. Mendeleeva, v. 6, no. 1, 1961, 81-87

TEXT: The new liquid-phase process of catalytic oxidation of ortho-xylene to phthalic anhydride with air oxygen is being introduced into industry in the USSR. The use of orthoxylene expands the raw material base and eliminates difficulties in developing the production of phthalic anhydride due to limitations of naphthalene supplies from the coke and chemical industries. The present article deals with the process of producing phthalic anhydride in the vapor stage. For the vapor-phase oxidation of naphthalene and orthoxylene the same reactor can be used. The production of phthalic anhydride by the vapor-phase catalytic oxidation method is of the direct synthesis type, i.e., the ready product is produced from the initial material directly in a single-stage chemical transformation. The state of production

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Modernizing the apparatus and intensifying...

S/063/61/006/001/004/005  
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at the present time is characterized by the following features: 1) yields of ready product and losses; the difference between transformation percentage of naphthalene to phthalic anhydride and the yield of the distilled product is obtained through chemical and mechanical losses in production at the stages of recovering the anhydride and in distillation; 2) by the quality of the finished product: the purity of the raw product entering the vacuum distillation is higher in units working on vanadium-silicagel catalysts; 3) by the productivity of the equipment: the output of the evaporator should equal several hundred kilograms of naphthalene per hour and correspond to the productivity of the reactor; the activity of the catalyst determines the dimensions of the reactor; the thermo-technical qualities of the reactor and cooling medium affect the composition of the reaction products; special attention of research workers is given to the perfecting of the production of phthalic anhydride, to the catalyst and design of the reactor; these problems were dealt with by: perfecting and developing more powerful reactors working with a stationary layer and developing reactors working with a moving catalyst; a 1,500-t/year reactor is frequently used in the USSR; a fluidized bed is used for the purpose of developing a more perfected production pro-

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Modernizing the apparatus and intensifying...

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cess; catalysts should be fine-grained to eliminate complex dust-catching apparatus; the use of modern apparatus with highly developed surfaces in a small volume recovering phthalic anhydride in the solid phase and its subsequent fusion allows for complete mechanization of the process and due to the hermetically sealed design improves the sanitary conditions in the work; 4) by the mechanization of the production process of phthalic anhydride: this has been accomplished by the use of special railroad cisterns for transporting naphthalene, heat-exchangers for the recovery of liquid phthalic anhydride and further conveyance along special pipes, eliminating physical labor in these stages; 5) automation of the process due to the introduction of powerful reactor systems with stationary and fluidized beds of catalysts, apparatus for recovering phthalic anhydride, special heat-exchangers, etc; 6) by exact heat-control of the process, maintaining the required concentrations of the naphthalene-air mixture, hermetically sealed apparatus and pipelines, introduction of inert gas into apparatus, containing hot products or residues, etc. Several steps leading to the further perfection of phthalic anhydride production are listed: a) developing complete mechanization of collecting and storing of naphthalene, b) developing evaporators for naphthalene with melting points of 75 - 79°C, c) selecting new catalysts, d) developing

Card 3/4 .

Modernizing the apparatus and intensifying...

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the construction of powerful compact reactors, using the heat of reaction, e) improving the design of the locking and control apparatus for fused phthalic anhydride and special pumps with heating, f) introducing heat-exchangers with corrugated tubes, g) introducing apparatus of continuous distillation of phthalic anhydride for producing commercial products on large units with a productivity of 6 - 12 thousand t/year, h) developing complete automation of production with remote control. There are 5 diagrams and 11 references: 2 Soviet, 9 English. ✓

Card 4/4



LITVINENKO, M.K., veter. vrach (Cherkasskiy rayon, Cherkasskoy oblasti)

How we eradicated paratyphoid fever in piglets. Veterinariia 40 no.5:  
33-34 My '63. (MIRA 17:1)

BRIL'YEVA, N.I. [Bryl'ova, N.I.]; LITVINENKO, M.M. [Lytvnenko, M.M.]

Restoration and development of the drugstore network in Stalino and Lugansk Provinces during the decade 1943-1953. Farmatsev. zhur. 15 no.1:56-61 '60. (MIRA 14:5)

1. Kafedra organizatsii farmatsevtichnoi spravi Kharkivskogo farmatsevtichnogo institutu.

(STALINO PROVINCE---DRUGSTORES)

(LUGANSK PROVINCE---DRUGSTORES)

PIVNENKO, G.P. [Pivnenko, H.P.]; KRIVENCHUK, P.E. [Kryvenchuk, P.IE.];  
LITVINENKO, M.M. [Lytyvnenko, M.M.]; MARENICH, I.P. [Maronych, I.P.]

Connection of the higher school with production. Farmatsev. zhur.  
16 no.3:74-76 '61. (MIFA 14:6)  
(PHARMACY—STUDY AND TEACHING)

LITVINENKO, L.M.; PEREL'MAN, L.A.; LITVINENKO, M.M.

4-Methoxy-4'-aminobiphenyl. Metod.poluch.khim.reak.1 prepar.  
no.4/5:128-132 '62. (MIRA 17:4)

1. Khar'kovskiy gosudarstvennyy universitet imeni Gor'kogo.

SOV/112-59-1-1742

9(2)

Translation from: Referativnyy zhurnal. Elektrotehnika, 1959, Nr 1, p 246 (USSR)

AUTHOR: Borisova, O. I., and Lityvinenko, M. N.

TITLE: Miniature Oscillograph

PERIODICAL: Radiotekhn. proiz-vo, 1957, Nr 12, pp 36-37

ABSTRACT: A portable (140 x 150 x 225-mm) oscillograph intended for repairing and aligning radio equipment and using a 7LO55 picture tube is described. The sweep frequency is 5-cps - 15 kc, voltage span is 5-50 v, and vertical-amplifier passband goes up to 3 mc. The instrument is AC supplied at 220 v, 50 cps. The oscillograph is designed with 4 peanut-size tubes. Both continuous and slave sweeps are provided, as well as the possibility of synchronizing the sweep oscillator from the internal or an external source or from a 50-cps line. The rectifier is designed with semiconductor diodes. The principal diagram of the instrument is given.

S.A.B.

Card 1/1

LITVINENKO, M.N., kandidat farmatsevticheskikh nauk

Preparation of specialists in the organization of pharmacy. Apt.  
delo 5 no.4:30-32 J1-Ag '56. (MIEA 9:9)

1. Iz Khar'kovskogo farmatsevticheskogo instituta Ministerstva  
zdravookhraneniya USSR (dir. Yu.G.Borisayuk)  
(PHARMACY)

LITVINENKO, M.N.

NATANZON, D.I., student V kursa; LITVINENKO, M.N., kand. farmatsevticheskikh nauk

Organising the collection of vegetable drug material by pharmacy  
No.93 in Zmiyev District, Kharkov Province. Apt.delo 6 no.3:56-58  
My-Je '57. (MIRA 11:1)

1. Iz Khar'kovskogo farmatsevticheskogo instituta (dir. - dotsent  
Yu.G.Borisjuk).  
(BOTANY, MEDICAL) (MATERIA MEDICA, VEGETABLE)

~~LITVINENKO, M.N.~~ PIVNENKO, G.P.

Chemical investigation of ethereal oils from valerian rhizomes  
and roots. Ukr.khim. zhur. 23 no.6:761-764 '57. (MIRA 11:1)

1.Khar'kovskiy farmatsevticheskiy institut.  
(Essences and essential oils) (Valerian)



*LITVINEKO, M.N.*

LITVINEKO, M.N.

Sesquiterpene alcohols from valerian rhizomes and roots. Ukr.khim.  
zhur. 23 no.6:765-766 '57. (MIRA 11:1)

1. Khar'kovskiy farmatsevticheskiy institut.  
(Alcohols) (Valerian)

LITVINENKO, M.N.

Field experience of students in the organization and economics of pharmaceutical enterprises. Apt.delo 8 no.4:30-33 J1-Ag '59.  
(MIRA 12:10)

1. Iz Kur'kovskogo farmatsevticheskogo instituta Ministerstva  
zdravookhraneniya USSR.

(PHARMACY--STUDY AND TEACHING)

BYILEVA, N.I.; LITVINENKO, M.N.

Quality control of the production in the system of pharmacy  
administration. Apt. delo 12 no.2:15-18 Mr-Ap '63.  
(MIRA 17:7)

1. Khar'kovskiy farmatsevticheskiy institut.

BORISOV, M.I. [Borysov, M.I.]; LITVINENKO, M.N. [Lytvynenko, M.M.]

Role of the department of pharmacy and pharmacognosy of the Kharkov University and of its laboratories in the development of scientific and practical pharmacy. Farmatsev.zhur. 19 no.1:71-74 '64.

(MIRA 18:5)

1. Khar'kovskiy farmatsevticheskiy institut.

KOZYREV, N.T., inzh.; LITVINENKO, M.P., inzh.; SOROKIN, Ye.A., inzh.;  
SHIF, G.S., inzh.

Bottom-dump skip. Gor. zhur. no.7:62-63 J1 '61.

(MIRA 15:2)

(Mine hoisting)

KRASOVITSKIY, Ivan Konstantinovich; LITVINENKO, Mikhail Petrovich;  
AFONINA, G.P., red.; GORKAVENKO, L.I., tekhn. red.

[Operator of an electric mine locomotive] Mashinist shakhtnogo  
elektrovoza. Kiev, Gostekhizdat USSR, 1962. 145 p.  
(MIRA 15:6)

(Mine railroads) (Electric locomotives)

COMMON ELEMENTS										COMMON VARIABLE																																																	
MATERIALS INDEX										PROCESS AND PROPERTIES INDEX																																																	
<p>CP</p>										<p>Evaluation of various methods for the production of sulfuric acid from coke-gas hydrogen sulfide. M. V. Hofman and M. S. Litvinenko. <i>Coke and Chem. (U. S. S. R.)</i> 1939, No. 3, 30-32; <i>Khim. Referat Zhur.</i> 1939, No. 7, 73-4; cf. <i>C. A.</i> 33, 95087. For the recovery of <math>H_2S</math> from coke-oven gas, the following methods were investigated: "Pti," "Solord," phenolate, absorption with caustic soda, <math>NH_3</math> absorption and phosphate. None of these methods is recommended for use in the industry.</p> <p>W. R. Glenn</p>																																																	
ASB.SLA METALLURGICAL LITERATURE CLASSIFICATION										FROM SOURCE																																																	
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LITVINENKO, M.S.

LITVINENKO, M.S.; POSS, E.I., redaktor; BEKKER, O.G., tekhnicheskii  
redaktor.

[Coke by-products industry of the U.S.A.] Koksokhimicheskaya  
promyshlennost' SShA. Khar'kov, Gos. nauchno-tekhn. izd-vo lit-ry  
po chernoi i tsvetnoi metallurgii, 1947. 288 p. (MLWA 7:8)  
(United States--Coke industry) (Coke industry--United States)



M. S. LITVINENKO

① 4

Equilibrium in the system hydrogen sulfide and carbon dioxide and solutions of sodium or potassium carbonate. M. S. Litvinenko, *J. Appl. Chem. U.S.S.R.* 25, 679-95 (1952) (Engl. translation); *Zhur. Priklad. Khim.* 25, 510-31 (1952). The equil. were studied which exist when  $H_2S$  and  $CO_2$  are removed from industrial gases by absorption in dil. aq. solns. of  $Na_2CO_3$  or  $K_2CO_3$ . The process considered is essentially:  $M_2CO_3 + H_2S \rightleftharpoons MHCO_3 + MHS$ ;  $M_2CO_3 + CO_2 + H_2O \rightleftharpoons 2MHCO_3$ ; and  $MHS + CO_2 + H_2O \rightleftharpoons MHCO_3 + H_2S$ . The equil. was investigated by pumping purified coke-oven gas through a meter and humidifier to a mixer into which a definite vol. of  $H_2S$  and/or  $CO_2$  was added from a gas holder by means of a flow meter. From the mixer the gas entered the reaction flask contg.  $Na_2CO_3$  or  $K_2CO_3$  soln., which was placed in a thermostat. After passing through the flask and a reflux condenser the gas was burned. Periodic analyses were made of the soln. in the reaction flask. The following conditions were taken as criteria of equil.: (a) equil. in the reversible reaction is reached from both directions; (b) the same value of the equil. const. is obtained for different concns. of gas at const. temp.; (c) in order to obtain equil. the reacting substances are kept in close contact until the concn. of the gas in the soln. does not vary. When  $H_2S$  is absorbed by a 2N  $K_2CO_3$  soln., equil. in the system  $H_2S-K_2CO_3-KHCO_3-KHS-H_2O$  is detd. by the empirical const.,  $K_1 = ([KHCO_3][KHS]/[K_2CO_3])P_{H_2S}$ , where  $P_{H_2S}$  is the partial pressure of  $H_2S$  in mm. Hg. At 25°,  $K_1 = 0.074$  mol./l. mm. The relation between the vapor pressure of  $H_2S$ ,  $P$ , and the concn. of  $H_2S$  in a 2N soln. of  $K_2CO_3$ ,  $c$ , at equil. within the temp. range 25-60°, may also be expressed by the equation,  $P = 0.714(1 + 43)c^{1.01}$ . When  $H_2S$  is absorbed in a N soln. of  $Na_2CO_3$ , equil. in the system  $H_2S-Na_2CO_3-NaHCO_3-NaHS-H_2O$  is detd. by the empirical concn. const.,  $K_1 = [NaHCO_3][NaHS]/[Na_2CO_3]P_{H_2S}$ . At 25°,  $K_1 = 0.048$  mol./l. mm. With increase in temp. for the system of  $H_2S$  with  $Na_2CO_3$  (or  $K_2CO_3$ )  $K_1$  decreases. The relation

between  $K_1$  and temp. is expressed by  $\log K_1 = (2300/4.570 T) - 3.2$  for  $K_2CO_3$  and by  $\log K_1 = (2000/4.570 T) - 3.16$  for  $Na_2CO_3$ . The relation between the vapor pressure of  $H_2S$ ,  $P$ , and the concn. of  $H_2S$  in a N soln. of  $Na_2CO_3$ ,  $c$ , at equil. in the temp. range 20-60° may be expressed by the equation,  $P = 5.4(1 + 43)c^{1.01}$ . In the case of simultaneous absorption of  $H_2S$  and  $CO_2$  by an aq. soln. of  $K_2CO_3$  or  $Na_2CO_3$ , equil. in the system  $H_2S-CO_2-M_2CO_3-MHCO_3-MHS-H_2O$  is detd. by the const.  $K_2$ , which represents the ratio of the equil. consts.  $K_1$  and  $K_3$  in the systems  $H_2S-M_2CO_3-MHCO_3-MHS-H_2O$  and  $CO_2-M_2CO_3-MHCO_3-$

$H_2O$ . The value of  $K_2$ , calcd. from standard thermodynamic tables is of the order of unity and the variation of the thermodynamic potential for the reaction which det. this const. (i.e.  $MHCO_3 + H_2S = MHS + CO_2 + H_2O$ ) has the order zero. This indicates that for standard conditions the process is easily reversible, and small deviations from standard conditions may greatly affect the course of the process. The exptl. values of  $K_1$  for cases of simultaneous absorption of  $H_2S$  and  $CO_2$  by a 2N soln. of  $K_2CO_3$  or  $Na_2CO_3$ , are expressed at const. temp. by values of the same order of magnitude. The effect on  $K_1$  of the concn. and nature of the cation is insignificant and at const. temp. the ratio between  $H_2S$  and  $CO_2$  in the gaseous and liquid phases will not vary significantly as a result either of using a Na or a K soln. or of altering the concn. With increase in temp.  $K_1$  decreases. This is explained by the difference in the variation of the heat content function during the reactions of  $H_2S$  and  $CO_2$  with the absorbent. The variation in the heat content function for the reaction of  $CO_2$  with aq. solns. of  $K_2CO_3$  and  $Na_2CO_3$  is more than twice the analogous value for the reaction of  $H_2S$  with the same solns. From the established relation between  $K_1$  and temp. it is seen that lower temps. of absorption favor the absorption of higher quantities of  $CO_2$  in the process of absorption of  $H_2S$  by solns. of  $K_2CO_3$  or  $Na_2CO_3$ , where  $CO_2$  is present along with the  $H_2S$ . If it should be necessary to have the min. quantity of  $CO_2$  in the absorbent soln., then the absorption process should always be carried out at the highest possible temps.

Herbert Liebeskind

LITVINENKO, M. S.

3  
①  
Rate of absorption of hydrogen sulfide by aqueous solutions of sodium or potassium carbonate. M. S. Litvinenko. *J. Appl. Chem. U.S.S.R.* 23, 775-84 (1950) (in English); *Zhur. Priklad. Khim.* 23, 606-717 (1952); cf. *C.A.* 42, 155. — The absorption of  $H_2S$  by aq. solns. of Na or K carbonate is a heterogeneous diffusion process accompanied by a fast reversible chem. reaction in the liquid phase. The rate of absorption of  $H_2S$  varies with the concn. of the absorbent in the soln. and with the partial pressure of the  $H_2S$ . The driving force of the process is the sum of the partial pressure of the  $H_2S$  and the pressure equiv. of the chem. capacity of the absorbent. In the region of partial pressures of  $H_2S$  from 0.02 to 0.70 atm., the rate of the process is very sensitive to changes in the concn. of the absorbent,  $c$ , in the soln.; in addn., changes in the concn. in the gas phase  $p$  affect the rate of absorption to a lesser degree. The resistance of the diffusion of the liquid boundary layer is 94.3% of the total diffusion resistance. The rate of absorption can be characterized approx. by the kinetic equation  $dG/dt = k(rc + p)$ , where  $G$  = amt. of substance absorbed,  $t$  = time,  $P$  = surface of contact between phases and  $r$  and  $k$  are coeff. In the region of low partial pressures of  $H_2S$  (below 0.02 atm.) a sharp change in the mechanism of absorption is observed. The liquid boundary layer practically stops controlling the process. Upon significant changes in the concn. of the absorbent the rate of absorption remains practically const., and in addn. sharply increases with increase in the partial pressure of the  $H_2S$ . For approx. calcn., the absorption can be characterized by the kinetic equation  $dG/dP = kp$ . The coeff. of the rate of absorption is 10-12% greater for  $K_2CO_3$  than for  $Na_2CO_3$  solns. At low partial pressures of  $H_2S$  the rate of absorption increases sharply with increase in the flow velocity of the gas. The change of the velocity of the liquid stream at low  $H_2S$  partial pressure has no significant effect on the rate of absorption.  
Don T. Cromer

LITVINENKO, M.S., doktor tekhnicheskikh nauk, professor; TALALAYEV, G.K. inzhener; KULIKOV, V.O., inzhener; BARNATSKIY, I.I., inzhener.

Hydrogen sulfide removal from coke-oven gas and the production of sulfuric acid at the Makeyevka Coke Plant. Koks i khim. no.2: 48-57 '55. (MLRA 9:3)

1. Ukrainskiy uglekhimicheskiy institut (for Litvinenko); 2. Makeyevskiy koksokhimicheskiy zavod (for Talalayev); 3. Makeyevskiy metallurgicheskiy zavod (for Kulikov, Barnatskii).  
(Coke-oven gas) (Sulfuric acid)

VODNEV, G.G.; SHELKOV, A.K.; DIDENKO, V.Ye.; FILIPPOV, B.S.; TSAREV, M.N.;  
 ZASHVARA, V.G.; LITYINENKO, M.S.; MEDVEDEV, K.P.; MOLODTSOV, I.G.;  
 LGALOV, K.I.; RUBIN, P.G.; SAPOZHNIKOV, L.M.; TYUTYUNNIKOV, G.N.;  
 DMITRIYEV, M.M.; LEYTES, V.A.; LERNER, B.Z.; MEDVEDEV, S.M.; REVIYAKIN,  
 A.A.; TAYCHER, M.M.; TSOGLIN, M.E.; DVORIN, S.S.; RAK, A.I.; OBUKHOV-  
 SKII, Ya.M.; KOTKIN, A.M.; ARONOV, S.G.; VOLOSHIN, A.I.; VIROZUR, Ye.V.;  
 SHVARTS, S.A.; GINSBURG, Ya.Ye.; KOLYANDR, L.Ya.; BELETSPAYA, A.F.;  
 KUSHNEREVICH, N.R.; BRODOVICH, A.I.; NOSALEVICH, I.M.; SHTROMBERG, B.I.;  
 MIROSHNICHENKO, A.M.; KOPELIOVICH, V.M.; TOPORKOV, V.Ya.; AFONIN, K.B.;  
 GOFTMAN, M.V.; SEMENENKO, D.P.; IVANOV, Ye.B.; PEYSAKHZON, I.B.;  
 KULAKOV, N.K.; IZBAELIT, E.M.; KVASHA, A.S.; KAPTAN, S.I.; CHERMNYKH,  
 M.S.; SHAPIRO, A.I.; KHALABUZAR', G.S.; SEKT, P.Ye.; GABAY, L.I.;  
 SMUL'SON, A.S.

Boris Iosifovich Kustov; obituary. Koks i khim. no.2:64 '55.(MLRA 9:3)  
 (Kustov, Boris Iosifovich, 1910-1955)

LITVINENKO, M.S.

2196. WIDENING OF THE FIELD OF SELECTION OF DRESS COALS FOR CARBONIZATION. Litvinenko, M.S., Teslenko, P.S. and Vnigberg, O.P. (Trud. Khark'kov. inzh.-ekon. inst. (Ukr. Khark'kov. inzh.-ekon. inst.), 1955, vol. 6, 17-51; abstr. in Ref. Zh. Khim. (Ref. J. Chem., Moscow, 1957, (11), 2835). A summary of papers on the widening of the raw material basis for carbonization by using gassy and non-caking coals. The addition of up to 5% gassy coals gives good results, but requires the addition of up to 3% of lean coals. Up to 10-15% of lean coals can be used for the production of cupola coke. The addition of long-flame coals causes high consumption of heat, poor physical and mechanical properties in the coke, the formation of spotty coke and cracks in cists. Stamping of a charge containing gassy and lean coals increases the operating and thermal expenditure and the coking time. The coke produced is no good for cupolas, but can be used as power station fuel. The lean fuel added may be coke fines, the addition of 5% of which produces good blast furnace coke. The use of anthracite in the blast oven charge and as a cupola charge gave negative results.

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LITVINENKO, M.S., doktor tekhnicheskikh nauk, professor.

Long-distance transmission of coke-oven gas in foreign countries.  
Koks i khim. no.1:33-39 '56. (MIRA 9:5)

1. Ukrainskiy uglekhimicheskiy institut.  
(Coke-oven gas--Transportation)

LITVINENKO, M.S.; NOSALEVICH, I.M.; GLUZMAN, I.D.; GIMMEL'SHTIYN, T.Ye.;  
KOLTUN, R.M.

Tasks of the byproduct coking industry in augmenting the number of  
coke-oven by-products. Koks i khim. no.3:41-45 '56. (MLRA 9:8)

1. Ukrainskiy/uglekhimicheskii institut (for Litvinenko, Nosalevich,  
Gluzman); 2. Giprokoks (for Gimmel'shteyn); 3. Khar'kovskiy  
koksokhimicheskii zavod.  
(Coke industry)

LITVINENKO, M.S., doktor tekhnicheskikh nauk.

Present-day methods for removing hydrogen sulfide from coke-oven gas in foreign countries. Koks i khim. no.7:56-61 '56. (ICRA 9:12)

1. Ukrainskiy uglokhimicheskiy institut.  
(Hydrogen sulfide) (Coke--Oven gas)



*Document No. 105*

Classification of industrial hydrogen sulfide-absorbing  
media by thermodynamic properties

7

and S. P. Lunin (Khim. tekhnol. 1978, No. 1, p. 100)

Inst. Khim. tekhnol. Akad. Nauk SSSR, Leningrad

The thermodynamic properties of hydrogen sulfide-absorbing

media are investigated. It is shown that the thermodynamic

properties of the media are determined by the nature of the

absorbent and the nature of the gas being absorbed.

The thermodynamic properties of the media are investigated

by the method of the thermodynamic properties of the

absorbent and the gas being absorbed.

absorber must be taken into account.

I. B. BUCOWITZ

*PM*

AUTHORS: Litvinenko, M.S. (Dr. of Tech.Sc.), and Vaysberg, O.P.,  
(Cand.Economic Sc.) 68-5-11/14

TITLE: Economics of the removal of sulphur from coke oven gas on the Southern Coke Oven Works. (Ekonomika izvlecheniya sery iz koksovogo gaza na koksokhimicheskikh zavodakh yuga).

PERIODICAL: "Koks i Khimiya" (Coke and Chemistry), 1957, No.5, pp.47-50 (U.S.S.R.).

ABSTRACT: The extent of the application of gas cleaning on Southern Works during 51-56 is shown in Table 1. Methods of utilizing sulphur recovered from the gas are briefly discussed. It is concluded that the production of sulphuric acid which can be used on the spot is the most economical. Technical-economical indices of the production of sulphuric acid from pyrites and from hydrogen sulphide recovered from coke oven gas are compared in Table 2. Two methods of gas desulphurisation are compared - arsenate-soda and vacuo-carbonate. The volumes of constructional work involved for the above two methods of desulphurisation are compared in Table 3. The plant operating on the vacuo-carbonate method is cheaper and simpler to build. The degree of desulphurisation of gas attained in 1956 on various Ukrainian works is compared, in Table 4, and from this it is concluded that both methods

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Economics of the removal of sulphur from coke oven gas on the Southern Coke Oven Works. (Cont.) 68-5-11/14

are comparable in the efficiency of desulphurisation, but the arsenate method presents difficulties due to a large volume (100m<sup>3</sup>/day) of highly poisonous effluent and high soda consumption (400-500 kg/ton of sulphur). The costs of gas desulphurisation by the above two methods on various works calculated on the same basis for 1955 were as follows:

<u>Works</u>	<u>Method of Cleaning</u>	<u>Costs per 1000 m<sup>3</sup></u>	
		<u>roubles</u>	<u>kopeks</u>
Zaporozsk	arsenate-soda	0	68
Zhdanov	" "	2	00
Dnepropetrovsk	" "	3	71
Makeyevsk	vacuo-soda	2	90

High cleaning costs on the Makeyevsk Works were due to high power consumption. In 1956 the works replaced soda by potash which resulted in a considerable economy (30-35%) in power, steam and water consumption. The cost of cleaning decreased from 2.90 Roubles in 1955 to 1.75 Roubles in 1956. It is concluded that from works operating gas cleaning, the installation on the Makeyevsk works is the most economical.

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By utilising waste heat from the coke oven works for the

Economics of the removal of sulphur from coke oven gas on the Southern Coke Oven Works. (Cont.) 68-5-11/14

regeneration of the absorbing solution, e.g., by utilising heat of ammonia liquor, as was done on the Kharkov works, a further decrease in cleaning costs can be obtained. A comparison of manpower required for cleaning gas by the above two methods (Table 5) indicates that the vacuo-carbonate method in this respect is also more economical. On the basis of the above comparisons it is recommended that the vacuo-carbonate method of desulphurisation together with the production of sulphuric acid by wet catalysis, should be widely applied in the coking industry of the U.S.S.R., while the construction of new plants based on the arsenate-soda method should be discontinued.

There are 5 tables and 3 Slavic references.

ASSOCIATION: UKhIN.

AVAILABLE:

Card 3/3

AUTHORS: Litvinenko ~~M.S.~~ and Nosalevich, I.M. 68-58-3-9/22

TITLE: Perspectives of Development of Processing Chemical Coking  
Products in the Coking Industry of the Ukrainian SSSR 1959-65  
(Perspektivy razvitiya pererabotki khimicheskikh produktov  
koksovaniya v koksokhimicheskoy promyshlennosti USSR v  
1959-1965 gg)

PERIODICAL: Koks i Khimiya, 1958, Nr 3, pp 34 - 37 (USSR)

ABSTRACT: In order to characterize potential possibilities of the  
coking industry an example of the possible recovery of raw  
products used for the manufacture of plastics and artificial  
fibres, which can be derived from 1,000 tons of coking blend,  
is discussed. There are 7 references, all Soviet.

ASSOCIATION: UKhIN

Card 1/1

AUTHOR: Litvinenko, M. S.

68-58-6-20/21

TITLE: Recovery of Chemical Coking Products on Coke Oven Works  
Abroad (Ulavlivaniye khimicheskikh produktov koksovaniya  
na zarubezhnykh koksokhimicheskikh zavodakh)

PERIODICAL: Koks i Khimiya, 1958, Nr 6, pp 58-62 (USSR)

ABSTRACT: This is a review of Western literature on the subject.  
There are 2 tables and 31 Western references.

ASSOCIATION: (UKhIN)

1. Chemical industry    2. Scientific reports    3. Coke--Processing

Card 1/1

LITVINENKO, M. S.

5(1)

PHASE I BOOK EXPLOITATION SOV/2127

Kokshinskoye proizvodstvo; sbornik statey (By-Product Coking Industry; Collection of Articles) Moscow, Metallurgizdat, 1959. 240 p. 2,500 copies printed.

Ed.: B. S. Filippov; Ed. of Publishing House: A. A. Ruyukin; Tech. Ed.: P. G. Tolst'yev

PURPOSE: The book is intended for engineers and technicians in the by-product coking industry and in scientific research institutes. The book may also be used by students in secondary and higher technical schools.

COVERAGE: The articles in this collection on the by-product coking industry appeared originally either in the periodical Koks i khimiya (Coke and Chemistry) or in other publications during 1955-1958. The book discusses the development of raw-material reserves for coking, technology of the manufacture of coke, quality of coke and further enlargement of the number of chemical coking products obtained. Some articles are devoted to a new procedure for preparing and beneficiating coals, new methods for coking, and to the mechanization and automation of industrial processes. References accompany individual articles.

Lorant, B. S. [Gosplan MFTS]. Partial Mechanization and Automation in Coking Plants 183

Kokshansk, B. S. [Metallurgizdat], and S. A. Sazonov [Gosplan MFTS]. Ferro-Coke and Its Use in the Blast Furnace 197

Brall, V. A. [Magitogorskiy metallurgicheskiy kombinat - Magitogorsk Metallurgical Combine]. Methods of Increasing the 60-80 mm Fraction of Metallurgical Coke 212

Litvinenko, M. S., and I. M. Mosalovich [MFTS]. Prospects of the Development of Frothing Chemical Obtained in the By-Product Coking Industry in the USSR. During 1959-1965 227

Mosalevich, I. M. [MFTS]. Progress in Developing a Larger Number of Primary Products in the Processing of Coal Tar 234

AVAILABLE: Library of Congress

LITVINENKO, Mikhail Semenovichi; BELOV, K.A., otv.red.; LIBERMAN, S.S.,  
~~red.izd-va; ANDREYEV, S.P., tekhn.red.~~

[Removal of hydrogen sulfide from coke-oven gas; vacuum-  
carbonate method. Khar'kov, Gos.nauchno-tekhn.izd-vo lit-ry  
po chernoi i tsvetnoi metallurgii, 1959. 304 p. (MIRA 12:11)  
(Coke-oven gas) (Hydrogen sulfide)



AUTHOR: Litvinenko, M.S., Doctor of Technical Sciences SOV/68-59-1-2/26  
TITLE: Problems of Chemical Utilisation of Coke-oven Gas  
(Voprosy khimicheskogo ispol'zovaniya koksovogo gaza)  
PERIODICAL: Koks i Khimiya, 1959, Nr 1, pp 6 - 9 (USSR)  
ABSTRACT: Present utilisation of coke-oven gas for various purposes  
is outlined (consumed at works - 27.5% , metallurgical  
works - 57.7%, for synthesis - 7.7%) and possibilities  
of increasing the use of coke-oven gas for the production  
of ammonia are discussed.  
ASSOCIATION: UKhIN

Card 1/1

Sov/68-59-10-10/24

AUTHOR: Litvinenko, M.S., Doctor of Technical Sciences

TITLE: Ways of Increasing Resources of Aromatic Hydrocarbons  
as Raw Materials for Polymers

PERIODICAL: Koks i khimiya, 1959, Nr 10, pp 33-37 (USSR)

ABSTRACT: After indicating the main synthetic products produced from benzole (fig 1) the problem of increasing the resources of aromatic hydrocarbons, particularly in the coking industry, is discussed. Average data for the USSR, on the increase in the output of benzole with changes in the proportion of gas coals in coking blends during 1940-1957 (fig 2) and seasonal variation in the yield of benzole (1953-1957 - fig 3), indicated that by increasing the proportion of gas and fat coal and improvements in the cooling system of gas and absorption oil to prevent a drop in the benzole yield during the summer period, an increase of the total output of benzole can be obtained. The problem of utilisation of gas coals in the coke gas works and additions of 2.5 - 3.0% of heavy petroleum oils to

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Sov/38-59-10-10/24

Ways of Increasing Resources of Aromatic Hydrocarbons as Raw Materials  
for Polymers

coking blends can substantially increase resources of aromatic hydrocarbons and its urgent investigation by research institutions is recommended. There are 3 figures and 6 references, including 4 Soviet, 1 English and 1 German.

ASSOCIATION: UKaIN

Card 2/2

S/S-8/80/000/002/001/003  
E071/E233

AUTHOR: Litvinenko, M. S.

TITLE: Production of Acetylene from Coke-Oven Gas

PERIODICAL: Koks i Khimiya, 1960, No. 2, pp. 34-39

TEXT: The methods and economics of production of acetylene from coke-oven gas are discussed. After a survey of the utilisation of coke oven gas components in the U.S.S.R., and abroad (summarised in Table 1) the author considers that the use of coke oven gas in the chemical industry should be developed in the U.S.S.R., particularly in regions where natural gas is not available. Since acetylene is one of the main basic raw materials for the production of a large number of synthetic products its production in the U.S.S.R., is rapidly increasing. However, acetylene is produced mainly by the carbide method, the capital and production costs of which are higher than by other methods (electrocracking of hydrocarbon gases, oxidising pyrolysis of methane, thermal cracking of propane). Costs comparison is given in Table 3. The construction of a number of plants for the production of acetylene from hydrocarbons is envisaged in the 7

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S/068/60/000/002/001/003  
E071/E233

Production of Acetylene from Coke-Oven Gas

year plan and soon a large experimental plant for the production of acetylene by the oxidising pyrolysis of methane should come into operation. The principles of the method are outlined. It is considered that the method is the most suitable for the production of acetylene from coke-oven gas and since it also yields the synthesis gas as a by-product, the acetylene plant should be linked with a plant for synthetic nitrogen fertilisers. The proposed interlinking of oxygen plants on iron and steel works with coking and chemical plants is diagrammatically shown in Figure 4. There are 4 tables, 4 figures and 12 references, including 10 Soviet, 1 English and 1 German. ✓

ASSOCIATION: UKhIN

Card 2/2

S/063/60/005/001/001/009

AUTHOR: Litvinenko, M. S., Professor

TITLE: The State and the Prospects of the Development of the Industry of Chemical Coking Products as Raw Material for the Chemical Industry in the USSR

PERIODICAL: Zhurnal vsesoyuznogo khimicheskogo obshchestva im. D. I. Mendeleyeva, 1960, Vol. 5, No. 1, pp. 10-17

TEXT: The output of chemical workshops in the coke-chemical plants is 3 million t of various chemical products per year at the present time. Although a considerable increase will be attained by 1965, it will be impossible to satisfy the demand of the Soviet economy as regards benzene, naphthalene, xylene, solvent, ortho-cresol and mesitylene. It is pointed out that centralized production of coke-chemical materials shows better results than production at individual coking plants. The benzene consumption will reach 216% in 1965 compared to that in 1959. The existing shortage of benzene can be reduced by the erection of coke-gas-chemical plants for the coking of gas coal which at present is burned as fuel; by increasing the percentage of gas coal in the present coking plants; by the pyrolysis of heavy petroleum oils in coking

Card 1/3

S/063/60/005/001/001/009

The State and the Prospects of the Development of the Industry of Chemical  
Coking Products as Raw Material for the Chemical Industry in the USSR

furnaces: the introduction of 2.5-3 weight % of petroleum oil into the coal charge, which corresponds to a total consumption of 2-3 million tons per year; increases the yield of crude benzene by 20-25% compared to the present level; by eliminating losses of benzene products, especially in summer by installing cooling devices. The percentage of pure benzene grades will be increased by 1965. The corresponding figures will be: benzene of I grade for synthesis 4.7%, II grade for synthesis 61.6%, benzene for nitration 8.4%, sulfur-free benzene 25.3%. The supply of naphthalene will be increased by raising the degree of its extraction out of the tar from 60% to 70%, and conducting research to increase it to 80%; by replacing crystalline naphthalene by commercial naphthalene in the production of phthalic anhydride; in 1965 more than 60% of the total naphthalene output will be used in the production of phthalic anhydride; the yield of phthalic anhydride from naphthalene will be increased to 75.8%; substitutes will be used for naphthalene in the production of surface-active compounds and phthalic anhydride. The supply of phenol products will be increased by raising the degree of extraction of phenolo-cresols from coal oils from 75-78% to 85-87%, and that of dephenolation of waste waters from 70% to 80%. The output of coking gas will exceed 30 billion m<sup>3</sup> in 1965. Nitrogen-fertilizer plants will be built which

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S/063/60/005/001/001/009

The State and the Prospects of the Development of the Industry of Chemical Coking Products as Raw Material for the Chemical Industry in the USSR

use hydrogen made from coking gas as raw material. The olefines and methane from coking gas will be used in the production of organic materials, acetylene, etc. In 1965, 760,000 t ethylene, 75,000 t propylene and 5,500 t methane will be produced from coking gas. The demand for several reagents will increase by 1965, e.g., anthracene, acenaphthene, vinyl-pyridine, decalin, dicresol, diphenic acid, carbazole, mesitylene, o-cresol, n-cresol, pyrene, tetralin, quinoline, and piperidine. There is a surplus of cyclic products which is not used by the chemical industry. Research work conducted does not completely agree with the needs of the industry. The main institute of the plastics industry, NIIPM, and the Leningrad institute of polymerization plastics are insufficiently investigating the use of carbazole, phenanthrene and acenaphthene as raw materials for plastics. The Moscow State University does not introduce into practice the results of research concerning the synthesis of plant growth stimulants on indole base. Pyridine and other products of the pyridine series are used only on a limited scale in the Soviet industry. There are 3 tables and 10 references: 6 Soviet, 2 German and 2 English.

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S/068/60/000/012/001/005  
E071/E435

AUTHORS: Litvinenko, M.S., Tyutyunnikov, Yu.B.,  
Vershinina, S.V., Dariyenko, V.I., Vorob'yev, D.D. and  
Tkachenko, N.A.

TITLE: An Increase in the Yield of Coke-Oven By-Products by  
the Pyrolysis of Heavy Petroleum Oils in Coke Ovens

PERIODICAL: Koks i khimiya, 1960, No.12, pp.8-10

TEXT: The results of laboratory and plant experiments on the possible increase in the yield of gas and benzole on coke blends with additions of fuel oil are described. Laboratory experiments (no details given) gave the following indications:

1) Additions of fuel oil to coal increase the bulk density of the charge. 2) The yield of gas, raw benzole and tar is higher than from ordinary coal blends. 3) The distribution of fuel oil between coking products varies within wide limits, depending on the amount of fuel oil added and coking conditions. More oil is transferred to gas and benzole when oil additions to coal are small and the free space temperatures are high. Under such conditions, up to 63.35% of oil is transferred into gas and up to 10.7% into Card 1/5

S/068/60/000/012/001/005  
EO71/E435

An Increase in the Yield of Coke-Oven By-Products by the Pyrolysis of Heavy Petroleum Oils in Coke Ovens

raw benzole, but the amount of tar formed decreases.

4) The composition of gas obtained on coking of charges containing fuel oil is characterized by somewhat increased content of hydrogen and unsaturated compounds. The composition of gas depends mainly on the degree of pyrolysis of the fuel oil vapours. 5) In all cases when additions of oil were made, a decrease in the formation of pyrogenic water was observed. 6) The quality of raw benzole and tar on coking blends containing fuel oil also depends on the conditions of pyrolysis. If the oil vapour suffered a high degree of pyrolysis, then in addition to an increased yield of benzole, the content of benzole fraction in the raw benzole was at a maximum (68.56%) and washing losses were only slightly higher than with benzole obtained from normal coal blends (from 6.5 to 7.5%). At low temperatures of the free space and other conditions being equal, the content of the benzole fraction in raw benzole decreased from 68.56 to 63.60% and washing losses increased to 10.79%. A further decrease in the degree of pyrolysis by decreasing the

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E071/E435

An Increase in the Yield of Coke-Oven By-Products by the Pyrolysis of Heavy Petroleum Oils in Coke Ovens

residence time of gases in the free space leads to a further increase in washing losses up to 13.53% and a decrease in the content of benzole fraction in the raw benzole to 63.3%.  
7) The tar produced from oiled coal has a somewhat lower specific gravity, increased content of free carbon and an insignificant decrease in the content of phenols. 8) The mechanical strength of coke remained unchanged. Plant experiments were carried out on four batteries of ovens of the ПДР-46 (PVR-46) type. The temperature of the free space of ovens was comparatively low and varied within the following limits: No.1 battery 695 to 753°C; No.2 725 to 770°C; No.3 612 to 707°C and No.4 650 to 760°C. The coking time on No.1 and 2 batteries was 13 hours 36 minutes and on No.3 and 4 15 hours 25 minutes. Temperatures in the control flues: No.1 and 2 pusher side 1325°C, coke side 1375°C; No.3 and 4 pusher side 1235°C, coke side 1280°C. Addition of 2% fuel oil (types 80 and 20) was effected by spraying the blend on the conveyor belt leading to the service bunkers. Mixing of Card 3/5